OCTOBER 24, 2007

THIRD QUARTER 2007
GROUNDWATER MONITORING DATA SUBMITTAL

AND SUMMARY OF
QUARTERLY GROUNDWATER MONITORING PROGRAM DATA
WITH PLANNED FUTURE GROUNDWATER MONITORING ACTIVITIES

FORMER MONTROSE AND STAUFFER FACILITIES AREA
HENDERSON, NEVADA

HARGIS + ASSOCIATES, INC.
HYDROGEOLOGY • ENGINEERING

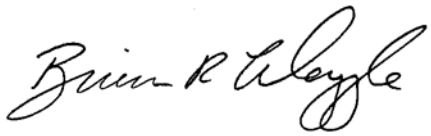
JURAT

I hereby certify that I am responsible for the services described in this document and for the preparation of this document. The services described in this document have been provided in a manner consistent with the current standards of the profession and to the best of my knowledge comply with all applicable federal, state and local statutes, regulations and ordinances.

For the services provided and attested to with this Jurat including the preparation of this data submittal.

I hereby certify that all laboratory analytical data was generated by a laboratory certified by the NDEP for each constituent and media presented herein.

HARGIS + ASSOCIATES, INC.



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Date Signed: October 24, 2007

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ACRONYMS AND ABBREVIATIONS

bgs	Below ground surface
beta-BHC	beta-Benzene hexachloride
CSM	Conceptual Site Model
EPA	U.S. Environmental Protection Agency
GWTS	Groundwater treatment system
H+A	Hargis + Associates, Inc.
MS/MSD	Matrix spike/matrix spike duplicate
MCL	Maximum Contaminant Level
Montrose	Montrose Chemical Corporation of California
msl	Mean sea level
NAPL	Non Aqueous Phase Liquid
NDEP	Nevada Division of Environmental Protection
OCPs	Organochlorine pesticides
PRG	Region IX Preliminary Remediation Goal
RCRA	Resource Conservation and Recovery Act
SOPs	Standard operating procedures
Stauffer	Stauffer Chemical Company
SMC	Stauffer Management Company LLC
Syngenta	Syngenta Crop Protection, Inc.
TDS	Total dissolved solids
the Companies	Montrose, SMC/Syngenta, and Olin Chlor-Alkali Corporation
the Workplan	Quarterly Groundwater Monitoring Workplan, Revision 1.0
UMCc	Coarse-grained Upper Muddy Creek Formation
UMCf	Fine-grained Upper Muddy Creek Formation
ug/l	Micrograms per liter
VOCs	Volatile organic compounds

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1.0 INTRODUCTION

This data submittal presents data obtained during the third quarter 2007 groundwater monitoring event. The third quarter 2007 monitoring event was conducted by Hargis + Associates, Inc. (H+A) on behalf of Montrose Chemical Corporation of California (Montrose), Stauffer Management Company LLC/Syngenta Crop Protection, Inc. (SMC/Syngenta) and Olin Chlor-Alkali Corporation (formerly Pioneer Americas, LLC; [the Companies]). All groundwater sampling and water level measurements were conducted during the period July 1, 2007 through September 30, 2007.

The third quarter 2007 monitoring event was conducted in accordance with the Quarterly Groundwater Monitoring Workplan, Revision 1.0 (the Workplan) and the conditional approval of the Workplan by the Nevada Division of Environmental Protection (NDEP) in a letter dated August 31, 2006 (H+A, 2006; NDEP, 2006). The Workplan was subsequently revised based in part on discussions during a meeting with NDEP on September 27, 2006. These revisions were discussed in the fourth quarter 2006 data submittal (H+A, 2007a).

The third quarter 2007 monitoring event consisted of the measurement of water level elevations and the collection of groundwater samples from monitor wells located within an area encompassing the former Stauffer Chemical Company (Stauffer) and Montrose facilities and an area downgradient of the facilities to Las Vegas Wash, Henderson, Nevada (the study area) (Figure 1). The purpose of the quarterly groundwater monitoring program was to collect data to assess potential seasonal variations in water levels, groundwater elevations, and groundwater quality in the study area (H+A, 2006).

The third quarter 2007 monitoring event was the fourth of the four planned quarterly monitoring events outlined in the Workplan. Pursuant to the Workplan; in addition to presenting data collected during the third quarter 2007 monitoring event, this data submittal also includes a summary and discussion of all monitoring data collected as part of the quarterly groundwater monitoring program (H+A, 2006). Recommendations for future groundwater monitoring are also provided in Section 8.0.

In addition, NDEP provided comments to the second quarter 2007 data submittal in a letter to the Companies dated August 6, 2007 (NDEP, 2007). Responses to these comments are provided in Appendix A of this data submittal.

2.0 SCOPE

The scope of the third quarter 2007 monitoring event included the measurement of water levels at 52 monitor wells and the collection of groundwater samples from a subset of 38 monitor wells completed in each of the hydrogeologic units present in the study area. Monitor well locations are presented in Figure 1.

The number and locations of the monitor wells were selected to provide site-wide spatial distribution of data to evaluate changes in water levels, contaminant migration patterns, and seasonal changes in contaminant concentrations in each of the hydrogeologic units. For the purposes of this data submittal and all subsequent project submittals, study area hydrogeologic units will be referred to using the nomenclature presented in the Conceptual Site Model (CSM) prepared by the Companies and submitted to NDEP in September 2007 (H+A, 2007c). Hydrogeologic units in the study area are referred to from shallowest to deepest as: 1) the alluvial aquifer, 2) the fine-grained Upper Muddy Creek Formation ([UMCf], previously referred to as the second water-bearing zone), and 3) the coarse-grained Upper Muddy Creek Formation ([UMCc], previously referred to as the third water-bearing zone) (H+A, 2007c).

This quarterly groundwater monitoring program was implemented concurrently with other routine groundwater monitoring activities conducted by the Companies. These additional activities include water level monitoring and groundwater sampling at an additional 29 monitor wells and extraction wells:

- Quarterly monitoring of two upgradient and three downgradient Consent Order monitor wells related to operation of the groundwater treatment system (GWTS);
- Quarterly monitoring of seven transect groundwater monitor wells related to operation of the GWTS immediately downgradient of the GWTS;
- Annual monitoring of the 13 groundwater extraction wells related to the GWTS, and
- Semi-annual monitoring of four monitor wells at the Montrose Closed Ponds (Figure 1).

The results of these monitoring activities are routinely summarized and submitted to NDEP under separate cover.

3.0 WATER LEVEL MEASUREMENTS

Water levels were measured in accordance with the standard operating procedures (SOPs) provided in the Workplan and subsequently prepared for the study area (H+A, 2006 and 2007b). Water levels were obtained from 51 of the 52 monitor wells during the monitoring event and 12 additional monitor wells designated as part of GWTS and Consent Order monitoring activities (Section 2.0). Alluvial aquifer monitor well ARP-6A has been filled with concrete and was not measured during this monitoring event. Attempts will be made to identify a suitable replacement for monitor well ARP-6A.

Water level data obtained during the third quarter 2007 monitoring event are presented in Table 1. Field forms used during water level measurements are included in Appendix B. The water level data were used to prepare a water level elevation contour map for the alluvial aquifer (Figure 2). These contours incorporate water level data measured in Consent Order and GWTS transect monitor wells to allow for a more complete presentation of water level data for the study area during the third quarter 2007.

Water levels have been plotted for the UMCf and UMCc (Figures 3 and 4). The data have not been contoured because: 1) productive zones within the UMCf are believed to be discontinuous and of limited areal extent; and 2) all but one of the UMCc monitor wells are located in a linear pattern, which does not allow the data to be contoured.

Hydrographs of the groundwater elevations for monitor wells located along each of the six monitoring transects are presented in Figures 5 through 12.

4.0 GROUNDWATER SAMPLING

Groundwater samples were collected in accordance with SOPs with the exception of some monitor wells which required minor modification to the sampling technique (Section 5.0). Groundwater samples were successfully obtained from all 38 designated monitor wells during the third quarter 2007 monitoring event.

Pursuant to the Workplan and conditional approval letter, groundwater samples were analyzed for:

- Volatile organic compounds (VOCs) using U.S. Environmental Protection Agency (EPA) Method 8260B;
- Semi-VOCs using EPA Method 8270C;
- Organochlorine pesticides (OCPs) using EPA Method 8081A;
- The organic acids dimethyl phosphorodithioic acid, benzenesulfonic acid, phthalic acid, diethyl phosphorodithioic acid, and 4-chlorobenzenesulfonic acid using high performance liquid chromatography;
- Resource Conservation and Recovery Act (RCRA) metals using EPA Methods 6010 and 6020, and
- Total dissolved solids (TDS) using EPA Method 160.1.

Groundwater samples were also analyzed for perchlorate using EPA Method 314.0 as directed by the Companies.

All analyses were conducted by Test America Laboratories, Inc., or other State of Nevada certified subcontractor laboratory. Water quality data obtained during the third quarter 2007 monitoring event are presented in Table 2. Field forms used during groundwater sampling are included in Appendix B and laboratory analytical reports are included in Appendix C.

The water quality data were used to prepare water quality maps for the prevalent VOCs and other selected analytes for each of the hydrogeologic units in the study area. The prevalent VOCs in the study area include chlorobenzene, benzene, chloroform, 1,2-dichlorobenzene, and

1,4-dichlorobenzene. The other selected analytes include arsenic, TDS, and beta-benzene hexachloride (beta-BHC) (Figures 13 through 36).

The alluvial aquifer water quality maps incorporate water quality data from the Consent Order and GWTS transect monitor wells. This allows for a more complete presentation of alluvial aquifer water quality data for the study area during the third quarter 2007. However, arsenic and TDS were not sampled for at the Consent Order and GWTS transect monitor wells, as the analytical schedule for these wells differ from that schedule used for this monitoring program. Beta-BHC was analyzed for in samples collected at the GWTS transect wells.

Pursuant to NDEP request, cross-sectional figures have also been prepared to illustrate hydrogeologic conditions across the study area for the third quarter 2007 (Figures 37 through 42). The cross-sections contain pertinent lithologic, water level, and water quality data for all monitor wells located along the six monitoring transects. These figures graphically illustrate the relationships between monitor well location and construction, lithology, water level conditions, and water quality conditions for the third quarter 2007.

Quality assurance/quality control sampling for the third quarter 2007 monitoring event consisted of the following:

- A trip blank for VOC analysis was submitted with each shipment to each laboratory and analyzed for VOCs. Review of the analytical data indicates that no VOCs were detected in the trip blanks during the monitoring event (Appendix C).

- When non-dedicated groundwater sampling equipment is used, one equipment rinsate blank was collected during the first day and last day that groundwater sampling was performed. The equipment rinsate blanks were analyzed for VOCs. Review of the analytical data indicates that low levels of benzene and chlorobenzene were detected in one equipment rinsate blank (Appendix C). Benzene was detected at a concentration of 40 micrograms per liter (ug/l). Chlorobenzene was detected at a concentration of 4.7 ug/l. No other VOCs were detected.

- Field duplicate samples were collected at a minimum frequency of one per 20 samples. Field duplicate samples were analyzed by the same analytical methods as was the original sample (Appendix C).

- A field blank was collected at a minimum of once per sampling day and analyzed for VOCs. Review of the analytical data indicates that no VOCs were detected in field blanks during the monitoring event (Appendix C).

Purge water generated during groundwater sampling was contained and characterized. After characterization, all purge water was disposed of off-site at a licensed facility in accordance with federal, state, and local requirements.

5.0 VARIATIONS FROM WORKPLAN

Variations from the Workplan occurred during the third quarter 2007 monitoring event. These variations included:

- Drawdown during the sampling at monitor well H-11 exceeded the goal of minimal drawdown of less than 0.1 meters or approximately four inches (Appendix B). This well is located in the southern portion of the former Stauffer and Montrose facilities where the alluvial aquifer is not productive. The exceedence of the drawdown goal is a reflection of this condition.

- Due to the limited saturated thickness encountered at monitor well B-7, the well could not be sampled using a low-flow submersible pump. The groundwater sample was collected using a decontaminated polyethylene bailer (Appendix B).

6.0 WATER LEVEL CONDITIONS – NOVEMBER 2006 TO JULY 2007

The Workplan requires a discussion of study area groundwater conditions upon the completion of the four quarterly monitoring events (H+A, 2006). The four monitoring events began during the fourth quarter 2006 (November 2006) and was completed during the third quarter 2007 (July 2007). For the purposes of this submittal, this period is referred to as the period of record. A summary of all water level data collected during the period of record and water level maps from previous quarters are provided in Appendix D.

The following sections discuss water level conditions for each of the three hydrogeologic units present in the study area. The discussions are based on the data collected during the period of record. Water quality conditions are discussed in Section 7.0.

6.1 ALLUVIAL AQUIFER

Water level data were collected on a quarterly basis at more than 50 alluvial aquifer monitor wells during the period of record. These alluvial aquifer monitor wells are located throughout the study area (Figure 1). Data from these monitor wells indicated that alluvial aquifer water level conditions varied temporally within the study area.

Depths to Water

Depths to water measured in alluvial aquifer monitor wells located in the southern portion of the study area and near the former Montrose and Stauffer facilities ranged from approximately 70 to 35 feet below ground surface (bgs) during the period of record. Depths to water were deepest in the southern portion of the study area near Lake Mead Parkway, becoming shallower to the north near the GWTS.

Depths to water from the GWTS north to Las Vegas Wash ranged from approximately 35 to less than 10 feet bgs during the period of record. Depths to water continued to become shallower from the GWTS to the north.

Groundwater Elevations

Groundwater elevations in the alluvial aquifer were highest in the southern portion of the study area decreasing in elevation to the north and northeast across the study area. Groundwater elevations in the southern portion of the study area ranged from approximately 1,790 feet mean sea level (msl) near Lake Mead Parkway to approximately 1,550 feet msl near Las Vegas Wash.

The overall slope of the alluvial aquifer groundwater surface is similar in nature to the slope of the land surface in the study area. Land surface elevations in the southern portion of the study area range from approximately 1,860 to 1,850 feet msl. Land surface elevations in the extreme northern portion of the study area, near Las Vegas Wash, range from approximately 1,560 to 1,550 feet msl.

Quarterly Variations

Alluvial aquifer groundwater elevations varied from quarter to quarter during the period of record. The direction (increase or decrease in elevations) and magnitude of changes in groundwater elevations varied based on location within the study area. In general, alluvial aquifer groundwater elevations in the southern portion of the study area and in the area of the former Montrose and Stauffer facilities increased slightly in elevation during the first three quarters of the period of record, and either remained relatively unchanged or decreased slightly in elevation during the last quarter (July 2007). These changes in elevations are illustrated in the water level hydrographs for Transects Nos. 1 through 4 (Figures 5, 6, 8 and 10). Both the increases and decreases in groundwater elevations from quarter to quarter were generally less than one foot. However, changes in elevation of greater than one foot were occasionally measured.

A review of historic water level data indicates that there is an overall, long-term increase in groundwater elevations in the southern portion of the study area and in the area of the former Montrose and Stauffer facilities. Water level data from monitor well MW-1 indicates increases in elevation by as much as 10 feet since the mid-late 1990s (Figures 5, 6 and 10).

In general, alluvial aquifer groundwater elevations in the northern portion of the study area have decreased during the period of record. These changes in elevations are illustrated in the water level hydrographs for Transects Nos. 5 and 6 (Figures 11 and 12). The decreases in groundwater elevations from quarter to quarter were greater than in the north compared to other portions of the study area. Decreases in elevation were typically greater than one foot from quarter to quarter.

Seasonal Trends

Water level data for most alluvial aquifer monitor wells are generally too limited to discern seasonal trends, especially for monitor wells located in the northern portion of the study area. A review of long-term data available for monitor well MW-1 indicates that no significant seasonal change in groundwater elevation occurs (Figure 5). However, it is recommended that water level monitoring continue within the study area in the future. Recommendations for future monitoring are discussed in Section 8.0.

6.2 FINE-GRAINED UPPER MUDDY CREEK FORMATION

Six UMCf monitor wells are located within the study area. Water level data were collected on a quarterly basis from all six of the UMCf monitor wells during the period of record. These monitor wells are located only in the area of the former Montrose facility (Figure 1). Data from these monitor wells indicated that UMCf water level conditions are generally similar in this area from monitor well to monitor well.

Depths to Water

Depths to water measured in UMCf monitor wells ranged from approximately 60 to 35 feet bgs during the period of record. Depths to water were deepest immediately north of the former Montrose facility, becoming shallower to the south near the Montrose Former Plant Site and Closed Ponds. There are no UMCf monitor wells located farther to the north of the former Montrose and Stauffer facilities.

Groundwater Elevations

Groundwater elevations in the UMCf were highest near the Montrose Closed Ponds decreasing in elevation to the north. Groundwater elevations ranged from approximately 1,790 feet msl at monitor well CP-1 to approximately 1,745 feet msl at monitor wells MC-MW-10 and MC-MW-11.

Quarterly Variations

UMCf groundwater elevations varied slightly from quarter to quarter during the period of record. Similar to the alluvial aquifer, UMCf groundwater elevations in the area of the former Montrose facility increased slightly in elevation during the first three quarters of the period of record, and remained relatively unchanged or decreased in elevation during the last quarter (July 2007). These changes in elevations are illustrated in the water level hydrographs for Transects Nos. 2 and 3 (Figures 7 and 9). Both the increases and decreases in groundwater elevations from quarter to quarter were less than one foot, with the exception of monitor well DPT-1. Monitor well DPT-1 exhibited fluctuations in groundwater levels of one to two feet during the period of record.

Seasonal Trends

Water level data for UMCf monitor wells are too limited to discern seasonal trends. A review of water level data for monitor well DPT-1 from 2004 to the present indicates that no significant seasonal change in groundwater elevation occurs. It is recommended that water level monitoring continue within the study area in the future. Recommendations for future monitoring are discussed in Section 8.0.

6.3 COARSE-GRAINED UPPER MUDDY CREEK FORMATION

Eight UMCc monitor wells are located within the study area. Water level data were collected on a quarterly basis from all eight of the UMCc monitor wells during the period of record. These monitor wells are located in a generally linear pattern along the southeastern boundary of the study area (Figure 1). Data from these monitor wells indicated that UMCc water level conditions varied across this area.

Depths to Water

Depths to water measured in UMCc monitor wells ranged from approximately 45 feet bgs to approximately 25 feet above ground surface during the period of record. Depths to water were deepest in the southern portion of the study area, approaching land surface immediately north of the former Montrose and Stauffer facilities, and rising above land surface north of the GWTS. UMCc monitor wells located north of the former Montrose and Stauffer facilities require caps and are fitted with pressure gages.

Groundwater Elevations

Groundwater elevations in the UMCc were highest in the southern portions of the study area decreasing in elevation to the north near the GWTS. Groundwater elevations ranged from approximately 1,810 feet msl in the southern portion of the study area to approximately 1,720 feet msl near the GWTS (Appendix D). There are no UMCc monitor wells located more than a few hundred feet north of the GWTS.

Quarterly Variations

UMCc groundwater elevations varied from quarter to quarter during the period of record. UMCc groundwater elevations in the area of the former Montrose and Stauffer facilities both increased and decreased in elevation during the period of record. These changes in elevations are illustrated in the water level hydrographs for Transects Nos. 2 through 3 (Figures 7 and 9). Both the increases and decreases in groundwater elevations from quarter to quarter were generally greater than one foot.

Seasonal Trends

Water level data for UMCc monitor wells are too limited to discern seasonal trends. A review of water level data for UMCc monitor wells MW-8 and TR-5 from 2004 to the present indicates that groundwater levels are increasing, but that no significant seasonal change in groundwater elevation occurs. It is recommended that water level monitoring continue within the study area in the future. Recommendations for future monitoring are discussed in Section 8.0.

6.4 GROUNDWATER MOVEMENT

Alluvial Aquifer

The direction of groundwater movement and gradient in the alluvial aquifer has remained consistent during the period of record. The direction of groundwater movement is to the north from the southern portion of the study area to the GWTS, thence to the northeast toward Las Vegas Wash. Water level contour maps prepared with data from each of the four monitoring events are provided (Figure 2; Appendix D).

The gradient in the southern portion of the study area to the former Montrose and Stauffer facilities has remained approximately 0.02 during the period of record. The gradient decreases to approximately 0.01 north of the former facilities to the Las Vegas Wash (Figure 2; Appendix D). The change in gradient across the study area is likely due to the changes in the lithologic nature of the alluvial aquifer and the slope of the land surface. A review of historic well data and recent drilling and well construction within the study area indicate that the alluvial aquifer becomes thicker and generally coarser-grained in the area north of the former Montrose and Stauffer facilities compared to the southern portion of the study area (H+A, 2007c).

Upper Muddy Creek Formation

Water level data are generally limited for the UMCf and UMCc. To date, UMCf monitor wells are located only in a relatively small area near the former Montrose facility. A review of water level data from these monitor wells indicates that the apparent direction of groundwater movement in the UMCf is consistently to the north, similar to the overlying alluvial aquifer (Figure 3; Appendix D). The gradient in the UMCf typically ranges from 0.02 to 0.03, relatively similar to the overlying alluvial aquifer.

The areal distribution of water level data for the UMCc is greater than for the UMCf. A review of water level data from the UMCc monitor wells indicates that the apparent direction of groundwater movement in the UMCc is consistently to the north-northeast, generally similar to

the overlying UMCf and alluvial aquifer (Figure 4; Appendix D). The gradient in the UMCc is typically 0.01, similar in nature to the overlying units.

Vertical Movement Between Units

Groundwater occurs in the UMCf under confined or semi-confined conditions. Groundwater levels rise in monitor wells completed in the UMCf to levels above the top of the Upper Muddy Creek Formation (H+A, 2007c). In most locations, groundwater elevations determined at monitor wells completed in the UMCf are approximately five to 10 feet higher in elevation compared to groundwater elevations at nearby alluvial aquifer monitor wells (Table 3; Appendix D). This indicates that an upward vertical gradient exists between the UMCf and the alluvial aquifer.

Groundwater occurs in the UMCc under confined conditions. Groundwater levels in monitor wells completed in the UMCc rise to levels significantly higher than the top of the Upper Muddy Creek Formation and in some localities rise above land surface. Groundwater elevations measured in UMCc monitor wells are typically 50 feet higher than groundwater elevations measured at nearby alluvial aquifer monitor wells. Groundwater elevations measured in UMCc are approximately 30 feet higher than groundwater elevations measured at nearby UMCf monitor wells (Table 3; Appendix D). These data indicate that there is an upward vertical groundwater gradient between the UMCc and the overlying UMCf and alluvial aquifer. These data also indicate that the finer-grained sediments of the UMCf act as a confining unit, or aquitard, above the UMCc.

7.0 GROUNDWATER QUALITY CONDITIONS – NOVEMBER 2006 TO JULY 2007

For the purposes of this submittal, the following sections discuss general groundwater quality conditions for selected organic and inorganic compounds and constituents; and any changes and/or trends in groundwater quality conditions for each of the three hydrogeologic units present in the study area. The discussions are based on the data collected as part of the quarterly groundwater monitoring program only during the period of record. A summary of all groundwater quality data collected during the period of record, analytical laboratory reports, and groundwater quality maps from previous quarters are provided in Appendix E.

Study area groundwater quality conditions were discussed in detail in the draft CSM submitted by the Companies to NDEP in September 2007 (H+A, 2007c). The draft CSM presented data obtained from several monitoring programs and focused investigations conducted by the Companies to characterize the nature and distribution of site-related chemicals throughout the study area. Groundwater quality data from this groundwater monitoring program, collected through April 2007, were incorporated into the draft CSM.

7.1 ALLUVIAL AQUIFER

Groundwater samples were collected from 27 alluvial aquifer monitor wells on a quarterly basis during the period of record. In addition, groundwater samples were also collected from 15 monitor wells located in the GWTS and the Montrose Closed Ponds areas. These monitor wells are located throughout the study area (Figure 1).

Organic Compounds

Concentrations of VOCs greater than their respective primary maximum contaminant levels (MCLs) were detected in groundwater samples from alluvial aquifer monitor wells located immediately north of the Montrose Closed Ponds, extending north into the area of the former Montrose and Stauffer facilities, and continuing north to the GWTS (Figures 13, 16, 19, 22, and 25; Appendix E). Concentrations of VOCs at and immediately north of the GWTS are either not

detected or are significantly lower; indicating the effectiveness of the GWTS in removing organic compounds from the alluvial aquifer. Concentrations of VOCs were generally not detected, or were detected at very low concentrations in the upgradient areas in the southern portion of the study area, and along the eastern and western margins of the study area. This distribution of VOCs is consistent to that defined in the draft CSM (H+A, 2007c).

Concentrations of the VOCs chlorobenzene, benzene, and chloroform, fluctuated on a quarter to quarter basis during the period of record. However, in general, concentrations of these VOCs remained relatively constant. No seasonal trends were discernable. Figures illustrating the concentrations of these VOCs during the period of record have been prepared (Figures 43 through 50).

Concentrations of beta-BHC greater than its Region IX Preliminary Remediation Goal (PRG) were detected in groundwater samples from alluvial aquifer monitor wells located in the same general areas as VOCs (Figure 28; Appendix E). This distribution of beta-BHC is consistent to that defined in the draft CSM (H+A, 2007c).

Concentrations of beta-BHC fluctuated on a quarter to quarter basis during the period of record. However, similar to other organic compounds, concentrations of beta-BHC remained relatively constant. No seasonal trends were discernable. Figures illustrating the concentrations of beta-BHC during the period of record have been prepared (Figures 43 through 50).

Inorganic Constituents

Arsenic was the only inorganic constituent detected at concentrations consistently greater than its primary MCL in the study area. Arsenic is present in groundwater samples above the MCL in groundwater samples collected from alluvial aquifer monitor wells throughout the study area. These data indicate that arsenic is a naturally occurring constituent in alluvial aquifer groundwater. However, concentrations of arsenic increase to their highest levels in the area of the former Montrose and Stauffer facilities and generally decrease in concentration to the north (Figure 31; Appendix E). This distribution of arsenic is consistent to that defined in the draft CSM (H+A, 2007c).

Similar to organic compounds, concentrations of arsenic fluctuated on a quarter to quarter basis during the period of record. However, in general, concentrations of arsenic remained relatively constant. No seasonal trends were discernable. Figures illustrating the concentrations of arsenic during the period of record have been prepared (Figures 43 through 50).

7.2 FINE-GRAINED UPPER MUDDY CREEK FORMATION

Groundwater samples were collected from all six of the UMCf monitor wells present in the study area on a quarterly basis during the period of record. These monitor wells are only located in the vicinity of the former Montrose and Stauffer facilities (Figure 1).

Organic Compounds

Concentrations of the VOCs greater than their respective MCLs were detected in groundwater samples from UMCf monitor wells located in the area near the former Montrose and Stauffer facilities (Figures 14, 17, 20, 23, and 26; Appendix E). Concentrations of VOCs were generally not detected, or were detected at low concentrations in the southernmost UMCf monitor well CP-1, located immediately north of the Montrose Closed Ponds. This distribution of VOCs is consistent to that defined in the draft CSM (H+A, 2007c).

Similar to alluvial aquifer conditions, concentrations of VOCs fluctuated on a quarter to quarter basis during the period of record. However, in general, concentrations of VOCs remained relatively constant. No seasonal trends were discernable. Figures illustrating the concentrations of VOCs during the period of record have been prepared (Figures 43 through 50).

Concentrations of beta-BHC greater than the PRG were detected in groundwater samples from UMCf monitor wells located in the same general areas as where elevated concentrations of VOCs were present. This distribution of beta-BHC is consistent to that defined in the draft CSM (H+A, 2007c).

Concentrations of beta-BHC were either not detected, or fluctuated on a quarter to quarter basis during the period of record. However, similar to other organic compounds, concentrations of

beta-BHC remained relatively constant. No seasonal trends were discernable. Figures illustrating the concentrations of beta-BHC during the period of record have been prepared (Figures 43 through 50).

Inorganic Constituents

Arsenic was the only inorganic constituent detected at concentrations consistently greater than its primary MCL in the study area. Arsenic is present in groundwater samples above the MCL in groundwater samples collected from UMCf monitor wells throughout the area near the former Montrose and Stauffer facilities. This distribution of arsenic is consistent to that defined in the draft CSM (H+A, 2007c).

Concentrations of arsenic fluctuated on a quarter to quarter basis during the period of record. However, in general, concentrations of arsenic remained relatively constant. No seasonal trends were discernable. Figures illustrating the concentrations of arsenic during the period of record have been prepared (Figures 43 through 50).

7.3 COARSE-GRAINED UPPER MUDDY CREEK FORMATION

Groundwater samples were collected from five of the UMCc monitor wells present in the study area on a quarterly basis during the period of record. These monitor wells are located along the southeastern boundary of the study area (Figure 1).

Organic Compounds

VOCs were predominantly not detected, or were only detected at sporadic, low level concentrations in groundwater samples from UMCc monitor wells in the study area (Figures 15, 18, 21, 24, and 27; Appendix E). Since VOCs were primarily not detected in the UMCc, no seasonal trends in concentrations were discernable.

Beta-BHC was also not detected in groundwater samples from UMCc monitor wells located in the study area (Figure 30; Appendix E). Since beta-BHC was not detected in the UMCc, no seasonal trends in concentrations were discernable.

Inorganic Constituents

Arsenic was the only inorganic constituent detected at concentrations consistently greater than its primary MCL in the study area. Arsenic is present in groundwater samples above the MCL in groundwater samples collected from UMCc monitor wells in the study area. This distribution of arsenic is consistent to that defined in the draft CSM (H+A, 2007c).

Concentrations of arsenic fluctuated on a quarter to quarter basis during the period of record. However, in general, concentrations of arsenic remained relatively constant. No seasonal trends were discernable. Figures illustrating the concentrations of arsenic during the period of record have been prepared (Figures 43 through 50).

8.0 FUTURE MONITORING ACTIVITIES

A review of the results of the recently completed quarterly groundwater monitoring program, and other study area characterization activities, suggest little evidence of seasonal variation in groundwater quality. However, it is acknowledged that four quarters of groundwater monitoring is likely not a sufficient amount of time to characterize groundwater quality trends across the entire study area. Accordingly, the Companies recommend continuing the groundwater monitoring program for an additional four quarters with additions and modifications to objectives and scope. The objectives and scope of the planned groundwater monitoring program are discussed in the following sections.

8.1 OBJECTIVES AND SCOPE

The objectives of the planned groundwater monitoring program are to: 1) collect additional data to further assess the potential for seasonal variations in water levels and groundwater quality; and 2) assess the nature and extent of non-aqueous phase liquids (NAPL) in the study area, if present.

The planned scope of work will consist of: 1) Four quarters of water level and NAPL measurements across the entire study area in monitor wells completed in each of the three hydrogeologic units; and 2) two groundwater sampling events;

- One comprehensive annual groundwater sampling event with samples collected from a large subset of monitor wells located across the study area. Groundwater samples will be analyzed for compounds and constituents identical to those in the recently completed groundwater monitoring program, and
- A second, abbreviated semi-annual groundwater sampling event with samples collected from a reduced subset of monitor wells. Groundwater samples will be analyzed for VOCs only.

Similar to the recently completed monitoring program, the number and locations of the monitor wells were selected to provide sufficient spatial distribution of data to evaluate changes in water

level and NAPL measurements, contaminant migration, and seasonal changes in contaminant concentrations in the various hydrogeologic units. Also, the planned groundwater monitoring program will supplement other routine groundwater monitoring activities conducted concurrently by the Companies (Section 2.0). A summary of these existing monitoring activities including well number, frequency of sampling, analyses conducted, and hydrogeologic unit monitored is presented in Table 4.

8.2 WATER LEVEL AND NON-AQUEOUS PHASE LIQUID MEASUREMENTS

Water level and NAPL measurements will be collected from 54 monitor wells, most of which comprised the recently completed groundwater monitoring program. The 54 monitor wells will include 40 monitor wells completed in the alluvial aquifer, six monitor wells completed in the UMCf, and eight monitor wells completed in the UMCc (Table 5). The water level data will be used to prepare water level contour maps of the alluvial aquifer, and other units to the extent possible.

Water levels and NAPL, if present, will be measured on a quarterly basis for four quarters. When these measurements coincide with the annual or semi-annual sampling event; the measurements will be collected immediately prior to commencing groundwater sampling activities. All attempts will be made to measure water levels and NAPL at all study area monitor wells within a 24-hour period. Water level and NAPL measurements will be conducted in accordance with the study area SOPs (H+A, 2007b).

8.3 GROUNDWATER SAMPLING

Annual Sampling Event

The planned annual sampling event will be very similar in scope to the recently completed groundwater monitoring program. However, three additional alluvial aquifer monitor wells will be added to the sampling event, EC-09, EC-06 and AA-MW-14. NDEP requested that monitor well EC-09 be added to the groundwater monitoring program in their comments to the second quarter 2007 data submittal (NDEP, 2007; Appendix A). Monitor well EC-06 is located immediately downgradient of the Stauffer Former Agricultural Chemicals Division Plant (Figure

51). Monitor well AA-MW-14 is located in the immediate vicinity of the Montrose Former Plant Site area (Figure 51). Water level, NAPL, and groundwater quality data from these monitor wells will provide additional alluvial aquifer information in the area immediately downgradient of these areas.

Groundwater samples collected during the planned annual sampling event will be analyzed for the full list of VOCs, SVOCs, OCPs, organic acids, RCRA metals, TDS, and perchlorate; identical to previous groundwater sampling events (Section 4.0).

Semi-Annual Sampling Event

Based on the results of the recently completed groundwater monitoring program, and other focused investigations conducted in the study area, the nature and areal distribution of chemicals in groundwater appear to be relatively consistent from quarter to quarter. Therefore, the Companies consider that the semi-annual sampling event can comprise a of reduced subset of the monitor wells sampled as part of the annual sampling event. This subset is as follows:

- From Transect No. 1: Monitor wells H-13, AA-MW-5, and H-11;
- From Transect No. 2: Monitor wells AA-MW-13, AA-MW-14, B-01, DPT-01 and TR-06;
- From Transect No. 3: Monitor wells EC-10, EC-09, MC-MW-11, MC-MW-10, and MC-MW-12;
- From Transect No. 4: Monitor wells B-18, AA-BW-12A, EC-02, and AA-MW-07;
- From Transect No. 5: Monitor well MW-K5, and
- From Transect No. 6: Monitor well MW-U and PC-086.

In addition, monitor wells PC-055, PC-031, and CP-01 will be included in the semi-annual sampling program (Figure 52). These monitor wells are not included in the six monitoring transects identified in the study area.

This subset will continue to provide sufficient spatial distribution of data to evaluate changes in water level and NAPL measurements, contaminant migration, and changes in contaminant concentrations during the seasons and in the various hydrogeologic units. Since VOCs are the

predominant contaminant in study area groundwater, and the concentrations of the other compounds and constituents appear to be relatively consistent from quarter to quarter, the Companies recommend that groundwater samples collected during the semi-annual sampling event be analyzed for VOCs only using EPA Method 8260B.

8.4 SAMPLING PROCEDURES

Groundwater sampling will be conducted in accordance with the study area SOPs (H+A, 2007b). Similar to the recently completed groundwater monitoring program, quality assurance/quality control sampling will consist of the following with some modification:

- A trip blank for VOC analysis will be submitted with each shipment to each laboratory where samples are to be analyzed for VOCs during both the annual and semi-annual sampling events;
- One equipment rinsate blank will be collected during the first day and last day that groundwater sampling is performed when non-dedicated groundwater sampling equipment is used. The equipment rinsate blanks will be analyzed for VOCs only;
- One field blank per day will be collected for analysis of VOCs only;
- Field duplicate samples will be collected at a minimum frequency of one per 20 samples. Field duplicate samples will be analyzed for VOCs, SVOCs, OCPs, organic acids, RCRA metals, TDS and perchlorate for the annual sampling event, and VOCs only for the semi-annual sampling event;
- Matrix spike/matrix spike duplicate (MS/MSD) samples will be submitted at a minimum frequency of one per 20 samples. MS/MSD samples will be analyzed for VOCs, SVOCs, OCPs, organic acids, RCRA metals, TDS and perchlorate for the annual sampling event, and VOCs only for the semi-annual sampling event, and
- A level 4 data validation package will be requested for each sample collected from a quarterly monitoring program well.

Purge water generated during groundwater sampling will be contained and characterized. Purge water will be disposed of off-site at a licensed facility in accordance with all federal, state, and local requirements.

8.5 PLANNED SCHEDULE AND REPORTING

It is the intent of the Companies to conduct the annual sampling event in January 2008 and the semi-annual sampling event in July 2008. Water level and NAPL measurements are planned to be conducted in January, April, July, and October of 2008.

Similar to the recently completed groundwater monitoring program, data submittals will be prepared and submitted to NDEP on a quarterly basis. The data submittals will be similar in format to those previously submitted. Similar to this report, the final data submittal will provide a summary of monitoring data collected during the four quarters and recommend changes and modifications to the program. The data submittals will be submitted to NDEP pursuant to the schedule below.

MONITORING EVENT	PLANNED DATE	DATA SUBMITTAL TO NDEP
Annual Sampling Event / Water Level and NAPL Measurements	January 14-25, 2008	March 31, 2008
Water Level and NAPL Measurements	April 14-18, 2008	June 30, 2008
Semi-Annual Sampling Event / Water Level and NAPL Measurements	July 14-25, 2008	September 30, 2008
Water Level and NAPL Measurements	October 13-17, 2008	December 31, 2008

9.0 REFERENCES

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